REMARKS

In the Office Action dated April 8, 2008, claims 1-3, 5-10, 12, 13 and 16-18 are pending, claims 1-3, 5-10, 12 and 13 are rejected and claims 16-18 are withdrawn from consideration. Reconsideration is requested for at least the reasons discussed hereinbelow.

The present invention, as set forth in claim 1, is directed to

[a] semiconductor apparatus comprising:

> a light input/output portion provided in an upper portion of a semiconductor substrate, the light input/output portion having an opening region for light associated to the light input/output portion to pass through, the opening region having a central axis and being bounded by a light shielding layer;
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> a transparent film covering and contacting the opening region, said transparent layer having an upper surface opposite the opening region, wherein said upper surface has a concave region formed therein above the opening region; and
>
> an interlayer lens provided on the concave region formed in the upper surface of the transparent film, the interlayer lens positioned such that an optical axis of the interlayer lens is aligned with the central axis of the opening region, so that the optical axis of the interlayer lens and the central axis of the opening region are parallel and matched,
>
> wherein the light shielding layer is asymmetric with respect to the central axis of the opening region, as viewed from a cross-section of the semiconductor apparatus, said central axis being perpendicular to the surface of the semiconductor substrate.

Claims 1-3, 5-10, 12 and 13 are rejected under 35 U.S.C. §103(a) over Nakai et al. (US Pub. 2003/016879; "Nakai") in view of Tanigawa (U.S. 6,784,014). As recognized by the Examiner, the Nakai reference has a common inventor. Further, the two applications are commonly owned.

In addition, Nakai fails to teach or suggest a transparent layer having a concave region formed over the opening region of the light shielding layer. Thus, Nakai does not have and fails to address the problem associated with the interlayer lens as discussed in the background portion of the above application and illustrated in Fig. 4, which is solved by the present invention. Regarding claim

12. Nakai fails to teach or suggest at least forming a concave region in the upper surface of the transparent film, and forming an interlayer lens provided on the concave region formed in the upper surface of the transparent film, the interlayer lens being formed such that an optical axis of the interlayer lens is aligned with the central axis of the opening region, so that the optical axis of the interlayer lens and the central axis of the opening region are parallel and matched.

Tanigawa is cited to make up for the deficiencies of Nakai. However, Tanigawa fails to teach or suggest the use of a light shielding layer that is asymmetric with respect to the central axis of the opening region. Thus, Tanigawa does not have and fails to address the problem associated with the interlayer lens as discussed in the background portion of the above application and illustrated in Fig. 4, which is solved by the present invention.

Further, Tanigawa fails to recognize even that there is a problem when the light shielding layer that is asymmetric with respect to the central axis of the opening region. Thus, Tanigawa is totally silent about solving the problem associated with the interlayer lens as discussed in the background portion of the above application and illustrated in Fig. 4, which is solved by the present invention.

The Examiner proposes combining the teachings of Nakai and Tanigawa. However, if one of ordinary skill in the art were to combine the teachings, because Nakai uses an asymmetric light shielding layer and Tanigawa uses a symmetric light shielding layer, such person of ordinary skill would be faced exactly with the problem discussed in the background portion of the above application and illustrated in Fig. 4, which is solved by the present invention. Neither Nakai not Tanigawa, not their combination suggests how to solve this problem. Only the present invention solves the problem.

The claimed invention, as set forth in claim 1 requires, *inter alia*,

"an interlayer lens provided on the concave region formed in the upper surface of the transparent film, the interlayer lens positioned such that an optical axis of the interlayer lens is

aligned with the central axis of the opening region, so that the optical axis of the interlayer lens and the central axis of the opening region are parallel and matched, wherein the light shielding layer is asymmetric with respect to the central axis of the opening region, as viewed from a cross-section of the semiconductor apparatus, said central axis being perpendicular to the surface of the semiconductor substrate."

The Examiner alleges that Nakai teaches an light shielding layer asymmetric with respect to the central axis of the opening region, and an interlayer lens 45 provided on the transparent film, where the interlayer lens is positioned such that an optical axis of the interlayer lens is aligned with the central axis of the opening region.

The Examiner admits that Nakai does not disclose the upper surface of the transparent film has concave region formed therein above the opening region, but alleges that Tanigawa teaches such. Therefore, the Examiner concludes that it would have been obvious to modify the invention of Nakai by using the transparent film/lens structure as taught by Tanigama "for the purpose of producing a lens with a smaller curvature".

Applicant respectfully submits that the alleged modification is entirely hindsight reasoning in an attempt to reach the claimed invention. Based on the teaching of Nakai and Tanigawa as an entirety, one skilled in the art would not have understand how to carry out the alleged modification, but would have been faced with the exact problem discussed in the background portion of the present application.

As discussed in MPEP §706.02(j), to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable

expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Further, as discussed in MPEP §2143.01(VI), THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. In *re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

The references must be considered as a whole, and it is well established that it is impermissible to pick and choose only so much as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly teaches or suggests.

In particular, the Examiner admits that Nakai fails to teach or suggest the upper surface of the transparent layer having a concave region formed over the opening of the light shielding region. In fact, Nakai teaches forming an overcoat layer 40 of a transparent material with a flattened surface and, subsequently, etching a projection 44 on the overcoat layer at predetermined position which is used as a core so that the intralayer lens material can be deposited around the projection 44 to form a convex lens (see Figure 3(a)-3(f), paragraph [0034], [0046]-[0049] of Nakai). Such method as a whole is essential for Nakai to successfully achieve a well-shaped lens.

There is not teaching or suggestion in Nakai that such a method as an whole can function if one were to modify the upper surface of the transparent layer from flattened surface to a concave region. For example, how can one etch a projection 44 at a predetermined position on a concave region. Moreover, even one were to modify Nakai in view of Tanigawa "for the purpose of producing a lens with a smaller curvature" by forming a concave region in the upper surface of the transparent layer, one will clearly be faced the exact problem discussed in the background portion of the present application, e.g., the problem caused by the light shielding layer asymmetric with respect to the central axis of the opening region.

There is no teaching in either Nakai or Tanigawa, or their combination, as to how such problem can be solved in order to achieve all the following limitations, a light shielding layer asymmetric with respect to the central axis of the opening region, a concave-shaped upper surface of the transparent film, and the optical axis of the interlayer lens aligned with the central axis of the opening region. Such problem is exactly what the present invention solves.

Tanigawa does not add anything more teaching to Nakai. For example, Tanigawa does not have asymmetric light shielding layer, therefore, to begin with fails to even recognize the problem of a deviated central axis (see, e.g., Figure 2B of Tanigawa). As such Nakai and Tanigawa in combination simply fail to provide a reasonable expectation of success to include all of the elements of the presently claimed invention.

It is impermissible simply to engage in hindsight reconstruction of the claimed invention, using applicants' structure as a template and selecting elements from references to fill in the gaps. *In re Gorman*, 18 USPQ2d 1885 (Fed. Cir. 1991).

Thus it is not seen how the presently claimed invention would have been obvious to one of ordinary skill in the art in view of any combination of Nakai and Tanigawa. The claimed invention, described in independent claims 1 and 12, is considered to be inventive over Nakai and Tanigawa. All the dependent claims are inventive for at least the same reasons.

In view of the discussion above, Applicant respectfully submits that the pending application is in condition for allowance. An early reconsideration and notice of allowance are earnestly solicited.

If for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, the Commissioner is hereby authorized and requested to charge Deposit Account No. 04-1105.

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Respectfully submitted,

By _____

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